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MINI REVIEW

Classification of Diabetes Mellitus: A Review

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Review

Type 1 Diabetes Mellitus

An autoimmune type 1 disease causes reduction in the production of Insulin causing less glucose intake into the cells and more glucose in the blood. It is caused due to Type 4 cell- Mediated Hypersensitivity where in the T cells attack the specialized insulin -producing beta cells located in islets of Langerhans in the pancreas. There is decrease in the self-Tolerance due to genetic abnormality. The activated cytotoxic T Lymphocytes migrates into the pancreases activating the macrophages which is referred as insulitis. This in turn activates the cytokine production which leads to a cell – mediated DTH response causing anti-islet cell antibody, anti-glutamic acid antibody and anti-insulin antibody production. These Beta cells are destroyed early in life before the symptoms start which is life threatening and the patient is treated with insulin therapy. This insulin dependent diabetes mellitus is caused by the regulation of the immune response in the Human leukocyte antigen system or HLA system which is a group of genes in the chromosome 6 that encode the Major Histocompatibility or MHC which is extremely important to maintain self-tolerance. In T1D patient HLA--DR3, HLA-DR4 specific HLA genes are found to be common and there is usually an increased frequency of islet specific auto reactive T lymphocytes and decreased regulatory immune system (Self Tolerance) which is caused by genetic abnormality which is fully not understood and sometimes it is also caused by virus. The symptoms of Type 1 Diabetes mellitus are Polyphagia, Glycosuria, Polyuria and Polydipsia. When there is lot of glucose in blood, starving the cells, the adipose tissue undergoes lipolysis converting fat to fatty acids and the muscle tissue breaks down the proteins causing weight loss. These fatty acids are further converted to ketone bodies by the liver causing Diabetic Ketoacidosis which may provide energy for the cells but increases the acidity in the blood which causes Kussmaul Respiration, Hyperkalemia and High anion gap. The late stage of this disease causes renal failure and blindness and loss of pancreatic tissue before treatment.

Type 2 Diabetes Mellitus

The insulin production is normal, but the tissue become insulin resistant causing less glucose intake into the cells and more glucose level in the blood. The insulin resistance can be caused due to various reasons like Lifestyle, Obesity, Genetics, or family predisposition but the exact reasons are still being explored. There is

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an increased level of insulin production by the beta cells causing beta hyperplasia (increase in the number of beta cells) and beta hypertrophy (increase in size) to balance the blood glucose level which further leads to beta hypotrophy (degeneration of beta cells) leading to decrease in insulin production. Another hormone that is secreted along with insulin is amylin, which is a peptide hormone and forms amyloid fibres, which may play a part in β-cell destruction. This causes a serious symptom Hyperosmolar Hyperglycemic state. It is is a syndrome characterized by severe hyperglycemia, hyperosmolality, and dehydration. Type 2 diabetes also show symptoms like Polyphagia, Glycosuria, Polyuria and Polydipsia.

Gestational Diabetes Mellitus

It is a transient stage detected in pregnant women. Risk of Gestational Diabetes mellitus increases if the person is overweight. It is usually seen in third trimester. This is more like T2D, insulin resistance is caused due to placental hormones like estrogen, progesterone, leptin, cortisol, and placental growth hormone causing increase in blood glucose level. To maintain glucose homeostasis, hypertrophy and hyperplasia of pancreatic β-cells occurs.

Pre-diabetes

It is an intermediate stage of hyperglycemia. Blood sugar level is in borderline higher than normal and lower than in diabetes. Prediabetes may or may not progress to diabetes. It is categorized by the presence of impaired fasting glucose or impaired glucose tolerance or both.

Drug Induced Diabetes

The drugs causing a disturbance in glucose homeostasis can lead to Type 2 Diabetes mellitus. The pharmacotherapy of major parts like pancreas and liver which is associated with insulin and glucose production and secretion can cause disturbance in glucose homeostasis.

References

1. Nidhi Bansal. Prediabetes diagnosis and treatment: A review. World J Diabetes. 2015;15:296-303.
2. Noble JA, Erlich HA. Genetics of Type 1 Diabetes. Cold Spring Harb Perspect Med. 2012;2:a007732.
3. Stayoussef M, Benmansour J, Al-Irhayim AQ, et al. Autoimmune Type 1 Diabetes Genetic Susceptibility Encoded by Human Leukocyte Antigen DRB1 and DQB1 Genes in Tunisia ASM J Clinical and Vaccine Immunol 2020;16:8.
4. Linda A DiMeglio, Carmella Evans-Molina, and Richard A Oram (2018). Type 1 diabetes. Lancet. 391, 2449-62.
5. Kharroubi AT, Darwish HM. Diabetes mellitus: The epidemic of the century. World J Diabetes 2015;6:850-67.
6. Zand A, Ibrahim K, Patham B, et al. Prediabetes: Why Should We Care. Methodist Debakey Cardiovasc J. 2018;14:289-97.
7. Olokoba AB, Obateru OA, Olokoba LB. Type 2 Diabetes Mellitus: A Review of Current Trends. Oman Med J 2012; 27:269-73.
8. Goyal R, Jialal I. Diabetes Mellitus Type 2. Treasure Island (FL): StatPearls Publishing. 202.
9. Cox EM, Elelman D. Test for screening and diagnosis of type 2 diabetes. Clin Diabetes 2009;4:132-8.
10. Padhia S, Nayak AK, Behera A. Type II diabetes mellitus: a review on recent drug-based therapeutics. Biomedicine & Pharmacotherapy 2020;131:110708.
11. Schmitz O, Brock B, Rungby J. Amylin Agonists: A Novel Approach in the Treatment of Diabetes. Diabetes 2004;53:S233-8.
12. Latek D, Rutkowska E, Niewieczerzal S, et al. Drug-induced diabetes type 2: In silico study involving class B GPCRs. PLoS One 2019;14:e0208892.